

SECTION 109 — CRITICAL PATH METHOD PROJECT SCHEDULE

109.01 DESCRIPTION. This work shall consist of the Contractor planning, scheduling, and constructing the project by using a Critical Path Method Project Schedule (CPM). The CPM shall be used for coordinating and monitoring all the work specified in the Contract Documents including all activities of subcontractors, vendors, suppliers, utilities, railroads, the Administration, and all other parties associated with the construction of the Contract. All work including but not limited to submittals, major procurement, delivery, and construction activities shall be included. All activities, including bid items, quantified in the Contract Documents shall be included in the CPM. The CPM shall be based upon the entirety of the Contract Documents. The software utilized for the CPM shall generate files that are compatible with Primavera Project Planner.

Float. The CPM utilizes float. Float is defined as the amount of time between when an activity “can start or finish” and when an activity “must start or finish”. Float is a shared commodity for the use of the Administration and the Contractor and is not for the exclusive use or benefit of either party. The parties have the full use of the float until it is depleted.

Scheduling Representative. The Contractor shall designate a scheduling representative, prior to submission of the Initial Critical Path Method Project Schedule (ICPM). The scheduling representative is the person primarily responsible for development and maintenance of the Contractor’s CPM schedule. The scheduling representative shall represent the Contractor in all matters regarding the schedule and shall attend all schedule related meetings. Replacement of the scheduling representative by the Contractor will require written approval from the Administration.

The Contractor shall submit the qualifications of the designated scheduling representative to the Administration for approval. This approval is required before the ICPM will be accepted. The designated scheduling representative shall have at least three years of verifiable experience for preparing and maintaining CPM project schedules on Contracts of the same or similar size and complexity.

Initial Critical Path Method Project Schedule (ICPM). The ICPM shall consist of:

- (a) A time scaled diagram. The ICPM time scaled diagram shall have a scale and format that is acceptable to the Engineer. The

activities shall be labeled with the activity identification clearly shown for each activity. All relationships between activities shall be shown.

(b) Tabular reports with activities sorted as follows:

- (1)** Activity ID. This report shall include predecessors and successors for each activity with leads and lags shown.
- (2)** Activity ID. This report shall include resources. This report shall clearly define the resources assigned to each activity.
- (3)** Early Start, Total Float.
- (4)** Total Float, Early Start.
- (5)** Project Area (if applicable).
- (6)** Project Phase (if applicable).
- (7)** Responsibility, e.g., Contractor, specific subcontractor, specific supplier, the Administration, etc.

The header of each tabular report shall include the project name, Contract number, data date, run date and number, and report type.

The body of each report shall include the activity identification, activity description, original and remaining duration, early/late start and finish dates, percent complete, actual start/finish dates, total float, and calendar designation for every activity.

- (c)** Written Narrative (WN). The WN shall comply with the requirements described hereinafter.
- (d)** Printed Calendars. The printed calendars shall include a listing, description, and calendar form tabulation of all calendars used in the ICPM. The calendars shall contain the total number of anticipated work days required to complete all the work required in the Contract. The calendars shall delineate the holidays and anticipated nonwork days or periods. An explanation of the Contractor's basis for determining each nonwork day or period shall be included in the WN.

- (e) Data disc containing all of the information contained in the CPM. The format shall be compatible with Primavera Project Planner software.

All construction activities shall have durations not exceeding 10 working days, unless otherwise approved by the Engineer. Activities required for review and approval of the working drawings and materials by the Administration shall be given a duration of not less than 30 calendar days. The Contractor may submit a short list of highly critical approval activities to the Engineer. The Engineer will make every effort to expedite the approval of these submittals, however, this will not alter the requirements to include 30 calendar days for all approvals in the ICPM. Activities for curing, pre-load, etc. shall be scheduled in calendar days. Durations for procurement activities will be evaluated on a case by case basis.

The latest calculated early finish date in the ICPM shall equal the Contract calendar date for completion specified in the Contract Documents. If the Contractor submits an earlier completion date than specified in the Contract Documents, the Administration, upon approval of the ICPM, will issue a change order to adjust the Contract time to the completion date shown on the ICPM.

The Contractor shall resource load all construction activities in its schedule with the material, equipment, and manpower planned to be utilized by the Contractor and its subcontractor in accomplishing each activity. Resource loading of the CPM shall be fully explained in the WN.

The Engineer reserves the right to specify the number of activities and to require at any time additional breakdown of the activities.

The Contractor shall utilize activity codes to categorize activities by at least the following: project area; project phase; and responsibility, e.g. Contractor or specific subcontractors.

The Contractor shall provide a WN as part of the ICPM. This WN shall explain the sequence of work, the critical path, interim completion dates, project phasing, nonwork days or periods, maintenance of traffic, and labor and equipment resources. In addition, the Contractor shall explain how it has provided for; permit requirements, environmental requirements, coordination with other public Contractors, milestone dates (for the Contract or other related contracts), coordination with other entities, coordination with all utility companies, special nonwork days or periods, and weather in its ICPM. The WN shall be used to explain the specific scope of each activity and the basis used to determine the original duration of each activity, i.e., production rates and anticipated quantities.

All activities quantified in the Contract Documents shall be addressed in the WN. The Contractor shall utilize the WN to explain the following:

- (a) Relationships between activities not obviously identified
- (b) Equipment usage and limitations.
- (c) Manpower usage and limitations.
- (d) Use of additional shifts and overtime.
- (e) Activity codes, abbreviations, and activity identification system.
- (f) All calendars utilized in the CPM.
- (g) Date or time constraints.
- (h) All abbreviations in the ICPM.
- (i) Use of calendars.
- (j) Scheduling of weather and temperature sensitive activities.

The Contractor shall complete and submit the proposed ICPM within 30 calendar days after receiving the Notice of Award and submit five sets of all information required to the Engineer for review and acceptance. No work shall begin until the Engineer has accepted the ICPM. Upon issuance of the Notice to Proceed, the start date utilized in the ICPM shall be adjusted to comply with the Notice to Proceed.

The Engineer will complete the review of the Contractor's ICPM within 30 calendar days after the submittal. If required, the Engineer will convene a Joint Review Conference at which time the Engineer and Contractor may make corrections and adjustments to the proposed ICPM. If a revision is necessary due to the Engineer's review or the Joint Review Conference, the proposed revision shall be submitted by the Contractor within seven calendar days after the Contractor receives the Engineer's review comments or within seven calendar days after the date of the Joint Review Conference whichever is the latest. Revisions shall conform to the requirements for the ICPM. The Engineer will respond to the revised ICPM within seven calendar days after the revised ICPM is received.

Any delay in starting work caused by the acceptance of the ICPM by the Engineer will not be considered as a basis for any adjustment in the Contract amount or time.

When the Engineer notifies the Contractor that the ICPM has been accepted, that document will become the CPM of record. The Contractor shall be responsible for implementing and executing the work specified in the Contract in strict conformance with the CPM of record. The CPM of record shall be the Contractor's work plan for completing the entire Contract as specified in the Contract Documents.

Failure of the Contractor to adhere to the CPM of record will be cause for the Administration to deny any and all requests for additional compensation or extensions of the Contract duration and may result in the Engineer withholding pay estimates.

CPM Updates. Monthly updates of the CPM of record are required. CPM update submissions shall contain the activity data as specified in (a) through (e) of the ICPM. The update shall be used to describe the progress of the project to date. The WN shall include a description of the work performed during the update periods, current critical path, the amount of float on the critical path, any delays or disruptions experienced by the Contractor during the period of the update, any change in manpower or equipment, and any potential delays or disruptions.

The Contractor's scheduling representative and the Engineer shall meet to review, mutually agree to, and sign-off on the information required to update (actual start and finish dates, remaining durations and percentages complete) the schedule. The Contractor shall use an update form acceptable to the Engineer. The data date for each update shall be seven days prior to the cut-off date of the pay estimate for that month. The update shall be submitted by the Contractor within seven calendar days from the data date. Failure to timely submit the update, may result in the Engineer withholding pay estimates. Upon acceptance by the Engineer, the update shall become the CPM of record for the period between its data date and the data date of the next approved update or revision.

Updates shall not include any revision to the CPM, unless prior approval by the Engineer is received for the insertion of minor revisions.

Revisions to the Schedule of Record. Revisions are defined as one or more of the following:

- (a) A change in the original duration of an activity.
- (b) A change in the logic of the schedule.
- (c) A change in the calendars or to the calendar to which an activity is assigned.

- (d) A change to resources.
- (e) A change to any actual date, previously established.
- (f) The deletion or addition of an activity.
- (g) A change to, addition of, or deletion of a date or time constraint
- (h) A change to, addition of, or deletion of an activity code.
- (i) A change to an activity description.
- (j) Any change other than updating an activity.

When the Contractor proposes to make a revision to the CPM, the Contractor shall verbally discuss the proposed revision with the Engineer. If the revision is minor in nature, the Engineer may allow the Contractor to include the revision on the next Update of the CPM. If the Engineer determines that the revision is not minor in nature, the Contractor shall submit the proposed revision to the Engineer for review and approval prior to deviating from the approved CPM.

When the Contractor is required to make a revision to the CPM due to changes in the Contract initiated by the Engineer, the Contractor shall immediately contact the Engineer to discuss the changes. If the revision is minor in nature, the Engineer may allow the Contractor to include the revision on the next Update of the CPM. If the Engineer determines that the revision is not minor in nature, the Contractor shall submit the proposed revision to the Engineer for review and approval prior to deviating from the approved CPM.

The Engineer may allow the Contractor to deviate from the approved CPM for specific mitigating activities.

The proposed revision shall be submitted to the Engineer in the same format and with the same requirements used for the ICPM. The proposed revision shall be made to the CPM of record at the time the revision is made, i.e. the revision shall include all update information and revisions previously approved and the additional progress to the date of the revision. The WN accompanying the proposed revision shall describe the reason for the revision, the resulting critical path, and all particulars of the revision. These shall include, but not be limited to, changes in the method or manner of the work, changes in specifications, changes in resources, addition or deletion of work, increased or decreased quantities, defective work, and acceleration of the work.

The Engineer will review and respond to the Contractor's proposed revision within 14 calendar days after its receipt. Resubmittal by the Contractor, if required, shall be made within seven calendar days after receipt of the Engineer's review comments. The Administration reserves the right to reject any proposed revision which adversely impacts the Administration, utilities, or other concerned parties.

Extensions of Contract Time or Incentive/Disincentive Date. All requests for an extension of Contract time shall be made in writing and are subject to the notice and timeliness of submission provisions as provided for elsewhere in the Contract. Any written request for an extension of Contract time or change in an incentive/disincentive date will be evaluated by the Engineer's analysis of the CPM of record and a proposed revision submitted by the Contractor. The request shall include a WN of the events which would require an extension of the Contract time or incentive/disincentive date.

Only delays to activities which affect the Contract completion date or incentive/disincentive date will be considered for an extension of Contract time. The extension of the specified Contract completion date or incentive/disincentive date will be based upon the number of calendar days the Contract completion date or incentive/disincentive date is impacted as determined by the Engineer's analysis.

When the Contractor fails to submit an acceptable Update or Revision within the time limits prescribed above, the Engineer may withhold pay estimates until an acceptable Update or Revision is submitted.

109.02 MATERIALS. Not Applicable.

109.03 CONSTRUCTION. Not Applicable.

109.04 MEASUREMENT AND PAYMENT. The accepted Initial Critical Path Method Project Schedule, Critical Path Method Project Schedule Revisions, and all accepted Critical Path Method Project Schedule Updates will be paid for at the Contract lump sum price for the CPM Project Schedule item. Fifty percent of the lump sum price will be paid upon acceptance of the Initial Critical Path Method Project Schedule (except when the price bid exceeds half of one percent of the total Contract price bid). The balance will be paid as a monthly prorated sum based upon the specified Contract duration. This monthly payment will be made on the next progress payment following the Administration's acceptance of the required monthly Critical Path Method Project Schedule updates.

When the price bid for the CPM Project Schedule exceeds half of one percent of the total Contract price, the total progress payments for the

Critical Path Method Project Schedule will be limited to half of one percent of the total Contract price. Any remaining balance (over half of one percent of the total Contract price bid) will be paid upon final Contract payment.

SECTION 110 — ACTIVITIES CHART PROJECT SCHEDULE

110.01 DESCRIPTION. This work shall consist of the Contractor planning, scheduling, and constructing this project using an Activities Chart (AC). The AC shall break down into detail the Contract time required to perform the work activities for the duration of the project. The AC shall be used for coordinating and monitoring all the work specified in the Contract Documents including all activities of subcontractors, vendors, suppliers, utilities, railroads, and all other parties associated with the construction of the Contract.

Initial Activities Chart Project Schedule (IAC). The IAC shall consist of:

- (a) A chronologically sequenced bar chart in which work activity durations shall be represented by working days, days, or completion date as specified in the Invitation for Bids (IFB).
- (b) A written narrative (WN) describing the original sequence of work, number of shifts per day, number of hours per shift, composition and number of crews, and the equipment to be utilized on each work activity. Subcontracting activities shall be listed.

The Contractor shall expend the entire Contract time specified in the IFB.

The Engineer reserves the right to specify the number of activities and require additional breakdown of the activities at any time.

The Contractor shall complete the proposed IAC within 14 days after receiving the Notice of Award and submit five sets to the Engineer for review and approval. The Engineer will review the Contractor's IAC within 30 days after the IAC is received. If required, the Engineer will convene a Joint Review Conference at which time the Engineer and Contractor may make corrections and adjustments to the IAC. Revisions to the IAC due to the Engineer's review or the Joint Review Conference shall be submitted to the Engineer by the Contractor within seven days from the date of the review for another review. Revisions shall conform